ABSTRACT

An image wavelength conversion device for converting an infrared light image into a visible light, a method of manufacturing the device, and an image conversion system using the device are provided.

The image wavelength conversion device is formed by an optical waveguide array 3 in which one end and the other end of each of a multitude of quasi-phase-matching sum frequency generating optical waveguides are aligned in a two-dimensional plane. One plane of the optical waveguide array 3 forms an incident plane which includes respective waveguides as elements thereof, and the other plane of the optical waveguide array 3 forms an exit plane which includes waveguides corresponding to the waveguides of the incident plane as elements thereof. From an incident light (λ_1) and an excitation light (λ_2) incident to an arbitrary element of the incident plane, an output light (λ_3) having the relationship of $(\lambda_1)^{-1}+(\lambda_2)^{-1}=(\lambda_3)^{-1}$ is generated in the corresponding waveguide element. λ_1, λ_2, and λ_3 here represent the wavelength of the incident light, the wavelength of the excitation light, and the wavelength of the output light, respectively.